

REMARKS/ARGUMENTS

Claims 1-4, 6-14, 26, 29-31, 33-39, and 50-60 are pending in this application. Of the pending claims, claims 1 and 26 are independent. Claims 1, 26, 52, 53, 56, and 58 have been amended herein. No new matter has been introduced into the claims by way of these amendments.

The previous prior art rejection over combinations of references that included the McLaughlin reference has been overcome. Claims 1, 4, 6-8, 10, 11, 26, 31, 33-35, 37, 50, and 55 are now rejected under 35 U.S.C. 103(a) as being unpatentable over Xanthos et al. (US 6,928,280) in view of Zappala et al. (US 2002/0127993) and in further view of Kudrimoti et al. (US 6,751,193). Claims 2, 3, 9, 12-14, 29, 30, 36, 38, 39, 51-54, and 56-60 are now rejected under 35 U.S.C. 103(a) as being unpatentable over a combination of Xanthos, Zappala, and Kudrimoti and in further view of Dyck et al. (2004/0260831). Thus, the current rejections rely on a new reference, Kudrimoti, to supply one or more missing elements for all claims.

Independent Claims 1 and 26

The subject matter of the present application generally relates to a system and method for computing latency in a mobile telephone network on a per-user-per-session basis without the need to modify user equipment, wherein, among other things, such computation allows billing the subscriber based on the latency specific to the user data session. An important aspect of the present application is that in order to streamline the system implementation and reduce implementation costs, an accounting parameter field is reconfigured and maintained such that the computed latency components are able to be accumulated by means of supplementary parameter attributes within a usage data record stored at the network equipment. *See Application, page 7.* Since the latency is computed by a network management element of the mobile network (e.g., a Packet Data Serving Node), changes to the subscriber equipment are not necessary, further reducing implementation costs and facilitating centralized network maintenance and upgrades. *See Application, pages 5, 10.*

The use of supplementary accounting parameter attributes for accumulation of latency data allows detailed user and session-level latency calculations to be recorded for subsequent billing (and/or reporting) purposes. Additionally, detailed latency computation and enhanced billing accuracy is achieved by separately computing wireless access round trip delay and internet access round trip delay components of latency. Specifically, an FMLT (Foreign Agent to Mobile Station Latency Time) accounting parameter attribute is added to record a wireless access delay component of latency between the mobile station and the network equipment and an FHLT (Foreign Agent to Home Agent Latency Time) accounting parameter attribute is added to record the internet access delay component of latency among the network management elements (e.g., PDSN/ Foreign Agent to Home Agent delay). *See Application, pages 7, 9, 12.*

To reflect the foregoing functionality, claim 1, as amended, recites: “**recording said latency in the accounting parameter field**” where the “accounting parameter field [comprises] at least one of: **an FMLT accounting parameter attribute associated with the first latency component and an FHLT accounting parameter attribute associated with the second latency component.**” *See Application, pages 7, 9, 12.* Computation of detailed FMLT and FHLT latency parameters above facilitates billing the user based on a predetermined quality of service by “**generating, by the server, a billing record for the user based on the latency recorded in the accounting parameter field for the user data session,**” as further reflected in claim 1. Claim 1 is reproduced below with relevant sections emphasized for reference.

A method for measuring latency between a first device and a second device during a user data session, said first and second devices communicating in accordance with a communications specification, said method comprising:

transmitting, during a user data session between said first and second devices, a message from said second device to said first device, said message being in accordance with said communications specification, said communications specification associated with a mobile telephone network;

during the user data session, receiving a response message from said first device, said response message being in accordance with said communications specification;

computing, during the user data session, an elapsed time from transmission of said message to receipt of said response message to determine said latency at a per user, per session level based on a round trip delay evidenced by the

elapsed time, said latency being computed by a network management element of the mobile telephone network and comprising at least one of a first latency component and a second latency component;

adding an accounting parameter field to a usage data record associated with the data session, the accounting parameter field comprising at least one of: **an FMLT accounting parameter attribute associated with the first latency component and an FHLT accounting parameter attribute associated with the second latency component**, wherein the first latency component represents a wireless access delay perceived by the network management element, and the second latency component represents an internet access delay between at least two network management elements, the usage data record provided by the communications specification, wherein the accounting parameter field extends the communications specification;

recording said latency in the accounting parameter field, the usage data record capable of being stored in computer readable memory of a server, the server configured to determine data usage in connection with the user data session and;

generating, by the server, a billing record for the user based on the latency recorded in the accounting parameter field for the user data session, the server processing the latency to bill the user based on a predetermined quality of service.

By contrast, the references of record do not disclose accumulating latency in an extended accounting field and billing the mobile subscriber based on the latency computed for the user data session. Furthermore, none of the cited references disclose maintaining the computed latency via a network management element of a mobile network in at least one of an FMLT accounting parameter attribute and an FHLT accounting parameter attribute. For instance, the new Kudrimoti reference relied on by the Office action for adding an accounting parameter field to a usage data record for storage of latency, is in point of fact unrelated to accounting functionality. The system of Kudrimoti merely monitors *one-way* (i.e., “forward link”) latency of data passing through a buffer in a base station on the way to a mobile station to determine whether sufficient channels have been allocated. *See Kudrimoti col. 4, lines 7-11.* In other words, *Kudrimoti is concerned with bandwidth management of forward link channels, rather than with alternate ways to calculate latency in order to bill the subscriber based on the*

computed round trip latency components. Therefore, the system of Kudrimoti has no need to process latency for billing purposes. In fact, column 3, lines 49-51 of Kudrimoti cited by the Office action for adding an accounting parameter field to a usage data record for storing latency, has no relation to such functionality. It merely discusses a channel controller 30 that stores queue length and rate to monitor the flow of data through a buffer. Since Kudrimoti lacks any disclosure of storing round trip latency in an accounting field, it is also missing the disclosure of storing the FMLT and FHLT accounting parameter attributes associated with various components of computed latency,¹ as well as generating a billing record based on the latency stored in the accounting parameters.

Furthermore, Zappala, cited by the Office action for recording latency in an accounting parameter field of a usage data record, is entirely silent with respect to latency being part of the list of performance parameters collected by the mobile station. *See* Zappala, par. 0040 (stating that typical performance messages collected from the mobile phone include “registration, paging, control channel, traffic channel, downlink signal strength, neighbor list and signal strength, bit error, time slot, phone mode, and handoff data.”). However, assuming, purely for the sake of argument, that Zappala were to measure latency, such measurement would: (a) only be performed at the mobile station and not at a “network management element of the mobile telephone network” as recited in the claims,² (b) would have no way to include the FMLT and FHLT accounting parameters since only one-way mobile station data “from the subscriber’s point of view”³ is collected in Zappala, while network side latency will remain unknown, and (c) would not be stored in an accounting parameter field since Zappala is only concerned with collecting performance data seen by the mobile station and is entirely unrelated to generating a billing record based on the latency. *See* Zappala, pars. 0039 – 0040. Applicants further note that Zappala teaches away from using any round trip data for billing purposes because it discourages merging performance data as seen by the mobile phone (drive testing data) with performance data collected from the switch (network-side performance data) – “[e]fforts have been made to

¹ In fact, Kudrimoti is limited to measuring only one-way latency of data passing through the RLP buffer 28. *See* Kudrimoti, Abstract; col. 3, lines 49-67.

² Zappala requires a modification to the mobile station to enable collection of performance data by addition of “performance system software” to the mobile phone. *See* Zappala, par. 0040.

³ *See* Zappala, Abstract.

merge the data from the switch and data from drive testing, but this is difficult.” Zappala, par. 0006.

The Applicants note that the Office action already states that Xanthos does not disclose recording latency in a usage data record. *See* Office action, page 4. Similar to Zappala and Kudrimoti, Xanthos only relates to network performance measurement issues.

In summary, neither Xanthos, nor Zappala or Kudrimoti teach or suggest storing latency in an accounting field for the purpose of billing the mobile subscriber based on the latency computed for the user data session, as recited by claim 1. Furthermore, none of the cited references disclose storing the latency computed by a network management element of a mobile network in at least one of an “FMLT accounting parameter attribute” and an “FHLT accounting parameter attribute.”

Claim 26, as amended, includes the foregoing elements of claim 1 and, therefore, should be patentable for at least the same reasons.

Obviousness Rationale Used in the Office Action

In addition to missing elements discussed above, the Applicants note that the rationale for combining Xanthos, Zappala, and Kudrimoti does not meet the Guidelines⁴ issued by the Patent Office after the Supreme Court’s KSR decision. A copy of the guidelines as published in the Federal Register is attached for the Examiner’s convenience. According to the Guidelines, in keeping with the Supreme Court’s KSR decision there are seven possible “rationales” for combining teachings in the prior art that will support a *prima facie* rejection of a claim for being obvious.

RATIONALES	
(1)	Combining prior art elements according to known methods to yield predictable results;
(2)	Simple substitution of one known element for another to obtain predictable results;
(3)	Use of known technique to improve similar devices (methods, or products) in the same way;

⁴ Federal Register, Vol. 72, No. 195, Wednesday, October 10, 2007.

RATIONALES	
(4)	Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
(5)	“Obvious to try” - choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
(6)	Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art;
(7)	Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

In this Office action, the rationale for combining selected features of Xanthos and Zappala is the assertion that it would be obvious “to modify Xanthos for the storage of performance information in data records” because “[o]ne of ordinary skill would have been motivated to employ the teachings of in order to enable the capability to quickly determine adjustments, and solving not easily seen problems or geographically limited problems.” Office Action, page 4 (citing Zappala, pars. 004 -005). Similarly, the rationale for combining Xanthos and Kudrimoti is the assertion that “[o]ne of ordinary skill in the art would have been motivated to employ the teachings of Kudrimoti in order for that the latency for a communications link is within a range that is deemed acceptable and the allocated communications channels are being usefully employed.” Office Action, page 6 (citing Kudrimoti, col. 4, ll. 33-38). It is not clear to the Applicants which one or more of the seven rationales apply to these statements. In view of the fact that Xanthos, Zappala, and Kudrimoti all deal only with network performance issues unrelated to using latency for accounting purposes, none of the seven rationales for combining references in the Patent Office KSR Guidelines justify the position taken by the Office action that Zappala and Kudrimoti may be combined with Xanthos to either store latency in a usage data record or add a new accounting parameter field to the usage data record for recording computed latency. Therefore, all seven (7) rationales are addressed hereinafter.

(1) *Combining prior art elements according to known methods to yield predictable results*

Since Zappala does not measure latency, while Xanthos and Kudrimoti only measure some aspects of latency in the context of network performance, the combination will not yield a system having any reason to store measured latency in an accounting parameter, which is unrelated to system performance.

(2) Simple substitution of one known element for another to obtain predictable results

There is no possibility of "simple substitution" because neither Xanthos nor Zappala or Kudrimoti teach or suggest storing latency in an accounting parameter field for the purpose of billing the user based on computed latency.

(3) Use of known technique to improve similar devices (methods, or products) in the same way

None of the cited references teach or suggest storing latency in an accounting parameter field for subsequent billing based on computed latency parameters. Therefore, none of the cited references establish a "known technique" to be applied for this purpose.

(4) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results

None of the cited references teach or suggest storing latency in an accounting parameter field for subsequent billing based on computed latency parameters. Therefore, none of the cited references establish a "known technique" to be applied for this purpose.

(5) "Obvious to try" - choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success

Nothing in Xanthos, Zappala or Kudrimoti, or in the art of mobile data system performance measurement, suggests storing latency in new accounting parameters for the purpose of billing.

(6) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art

Nothing in Xanthos, Zappala or Kudrimoti, in the art of mobile data system performance measurement or other related and unrelated fields, suggests storing latency, including at least one of the FMLT accounting parameter and the FHLT accounting parameter, in new accounting fields for the purpose of billing.

(7) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention

Not only is there no teaching or motivation in the cited references to store latency in the context of newly added accounting parameters, but Zappala, in fact, teaches away from using any round trip data for billing purposes because it discourages merging performance data as seen by the mobile phone (drive testing data) with performance data collected from the switch (network-side performance data) – “[e]fforts have been made to merge the data from the switch and data from drive testing, but this is difficult.” Zappala, par. 0006. Paragraph 0005 of Zappala cited by the Office action for the rationale justifying the combination, is not only unrelated to any accounting parameters, but it also discourages using network-side data (“switch statistics”) in favor of only collecting performance data from the mobile unit (“Because this method [using switch statistics] does not enable finer adjustments to be made, or even detected, this method is not helpful in solving network performance problems”). By contrast, all claims recite computation of latency at a “network management element” of the mobile telephone network and “recording said latency in the accounting parameter field.”

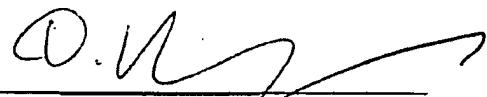
Dependent claims 2-4, 6-14, 29-31, 33-39, and 50-60

Dependent claims 2-4, 6-14, 29-31, 33-39, and 50-60 contain all of the limitations of their parent independent claims 1 and 26 and, therefore, are patentable for at least the same reasons.

Conclusion

Applicants respectfully submit that the patent application is in condition for allowance. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,



Dimitry Kapmar, Reg. No. 62,998
LEYDIG, VOIT & MAYER, LTD.
Two Prudential Plaza, Suite 4900
180 North Stetson Avenue
Chicago, Illinois 60601-6731
(312) 616-5600 (telephone)
(312) 616-5700 (facsimile)

Date: February 25, 2009

Special Accommodations

This meeting is physically accessible to people with disabilities. Requests for sign language interpretation or other auxiliary aids should be directed to Paul J. Howard (see ADDRESSES) at least 5 days prior to the meeting date.

Dated: October 3, 2007.

Tracey L. Thompson,

Acting Director, Office of Sustainable Fisheries, National Marine Fisheries Service.

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DEPARTMENT OF COMMERCE**Patent and Trademark Office**

[Docket No.: PTO-P-2007-0031]

Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 In View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*

AGENCY: United States Patent and Trademark Office, Commerce.

ACTION: Notice.

SUMMARY: The United States Patent and Trademark Office (USPTO) is publishing examination guidelines for determining obviousness under 35 U.S.C. 103 in view of the Supreme Court decision in *KSR International Co. v. Teleflex Inc.* These guidelines will assist USPTO personnel to make a proper determination of obviousness under 35 U.S.C. 103 and to provide an appropriate supporting rationale.

DATES: These guidelines are effective October 10, 2007.

FOR FURTHER INFORMATION CONTACT: Contact either Kathleen Kahler Fonda, Legal Advisor (telephone (571) 272-7754; e-mail kathleen.fonda@uspto.gov) or Pinchus M. Laufer, Patent Examination Policy Analyst (telephone (571) 272-7726; e-mail pinchus.laufer@uspto.gov), of the Office of the Deputy Commissioner for Patent Examination Policy. Alternatively, mail may be addressed to Ms. Fonda or Mr. Laufer at Commissioner for Patents, attn: KSR, P.O. Box 1450, Alexandria, VA 22313-1450.

SUPPLEMENTARY INFORMATION: These guidelines are intended to assist Office personnel to make a proper determination of obviousness under 35 U.S.C. 103, and to provide an appropriate supporting rationale in view of the recent decision by the Supreme Court in *KSR International Co. v. Teleflex Inc.* (KSR).¹ The guidelines are

based on the Office's current understanding of the law, and are believed to be fully consistent with the binding precedent of the Supreme Court.²

These guidelines do not constitute substantive rule making and hence do not have the force and effect of law. They have been developed as a matter of internal Office management and are not intended to create any right or benefit, substantive or procedural, enforceable by any party against the Office. Rejections will continue to be based upon the substantive law, and it is these rejections that are appealable. Consequently, any failure by Office personnel to follow the guidelines is neither appealable nor petitionable.

To the extent that earlier guidance from the Office, including certain sections of the current Manual of Patent Examining Procedure (MPEP), is inconsistent with the guidance set forth herein, Office personnel are to follow these guidelines. The next revision of the MPEP will be updated accordingly.

I. The KSR Decision and Principles of the Law of Obviousness

Teleflex owned a patent claiming technology useful in the gas pedal of a car. The invention at issue in *KSR* was a pedal assembly that could be adjusted to accommodate drivers of different statures. The electronic pedal-position sensor was positioned on the support for the pedal assembly, and the pivot point of the pedal remained fixed regardless of how the pedal assembly was adjusted. This combination of the fixed pivot point for the adjustable pedal and the fixed sensor position on the support resulted in a simpler, lighter, and more compact design.

Teleflex sued KSR for infringement. The district court cited references that separately taught adjustable pedals and sensors, and found on summary judgment that Teleflex's patent was invalid for obviousness. On appeal, the Federal Circuit vacated the district court's decision, and remanded the case. The Federal Circuit stated that "the district court's analysis applied an incomplete teaching-suggestion-motivation test" in arriving at the finding of obviousness.³

Upon KSR's petition for review of the Federal Circuit's decision, the Supreme Court reversed, concluding that the district court had correctly determined that the patent was invalid for

² Further developments in the law of obviousness are to be expected in view of *KSR*. Thus, it is not clear which Federal Circuit decisions will retain their viability.

³ *Teleflex Inc. v. KSR Int'l Co.*, 119 Fed. Appx. 282, 288 (Fed. Cir. 2005).

obviousness. The Supreme Court reaffirmed the familiar framework for determining obviousness as set forth in *Graham v. John Deere Co.*, but stated that the Federal Circuit had erred by applying the teaching-suggestion-motivation (TSM) test in an overly rigid and formalistic way.⁴ Specifically, the Supreme Court stated that the Federal Circuit had erred in four ways: (1) "By holding that courts and patent examiners should look only to the problem the patentee was trying to solve;"⁵ (2) by assuming "that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem;"⁶ (3) by concluding "that a patent claim cannot be proved obvious merely by showing that the combination of elements was 'obvious to try';"⁷ and (4) by overemphasizing "the risk of courts and patent examiners falling prey to hindsight bias" and as a result applying "[r]igid preventative rules that deny factfinders recourse to common sense."⁸

In *KSR*, the Supreme Court particularly emphasized "the need for caution in granting a patent based on the combination of elements found in the prior art,"⁹ and discussed circumstances in which a patent might be determined to be obvious. Importantly, the Supreme Court reaffirmed principles based on its precedent that "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results."¹⁰ The Supreme Court stated that there are "[t]hree cases decided after *Graham* [that] illustrate this doctrine."¹¹ (1) "In *United States v. Adams*, * * * [t]he Court recognized that when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result."¹² (2) "In *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, * * * [t]he two [pre-existing elements] in combination did no more than they would in separate, sequential operation."¹³ (3) "[i]n *Sakraida v. AG Pro, Inc.*, the Court derived * * * the conclusion that when

⁴ *KSR*, 550 U.S. at __, 82 USPQ2d at 1391.

⁵ *Id.* at __, 82 USPQ2d at 1397.

⁶ *Id.*

⁷ *Id.*

⁸ *Id.*

⁹ *Id.* at __, 82 USPQ2d at 1395.

¹⁰ *Id.*

¹¹ *Id.*

¹² *Id.*

¹³ *Id.*

a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious.”¹⁴ (Internal quotations omitted.) The principles underlying these cases are instructive when the question is whether a patent application claiming the combination of elements of prior art would have been obvious. The Supreme Court further stated that:

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, 35 U.S.C. 103 bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.¹⁵

When considering obviousness of a combination of known elements, the operative question is thus “whether the improvement is more than the predictable use of prior art elements according to their established functions.”¹⁶

II. The Basic Factual Inquiries of *Graham v. John Deere Co.*

An invention that would have been obvious to a person of ordinary skill at the time of the invention is not patentable.¹⁷ As reiterated by the Supreme Court in *KSR*, the framework for the objective analysis for determining obviousness under 35 U.S.C. 103 is stated in *Graham v. John Deere Co.*¹⁸ Obviousness is a question of law based on underlying factual inquiries. The factual inquiries enunciated by the Court are as follows:

- (1) Determining the scope and content of the prior art;
- (2) Ascertaining the differences between the claimed invention and the prior art; and
- (3) Resolving the level of ordinary skill in the pertinent art.

Objective evidence relevant to the issue of obviousness must be evaluated by Office personnel.¹⁹ Such evidence, sometimes referred to as “secondary considerations,” may include evidence of commercial success, long-felt but unsolved needs, failure of others, and unexpected results. The evidence may be included in the specification as filed.

¹⁴ *Id.* at ___, 82 USPQ2d at 1395–96.

¹⁵ *Id.* at ___, 82 USPQ2d at 1396.

¹⁶ *Id.*

¹⁷ 35 U.S.C. 103(a).

¹⁸ 383 U.S. 1, 148 USPQ 459 (1966).

¹⁹ *Id.* at 17–18, 148 USPQ at 467.

accompany the application on filing, or be provided in a timely manner at some other point during the prosecution. The weight to be given any objective evidence is decided on a case-by-case basis. The mere fact that an applicant has presented evidence does not mean that the evidence is dispositive of the issue of obviousness.

The question of obviousness must be resolved on the basis of these factual determinations. While each case is different and must be decided on its own facts, the *Graham* factors, including secondary considerations when present, are the controlling inquiries in any obviousness analysis.²⁰ As stated by the Supreme Court in *KSR*, “While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.”²¹

Office Personnel as Factfinders

Office personnel fulfill the critical role of factfinder when resolving the *Graham* inquiries. It must be remembered that while the ultimate determination of obviousness is a legal conclusion, the underlying *Graham* inquiries are factual. When making an obviousness rejection, Office personnel must therefore ensure that the written record includes findings of fact concerning the state of the art and the teachings of the references applied. In certain circumstances, it may also be important to include explicit findings as to how a person of ordinary skill would have understood prior art teachings, or what a person of ordinary skill would have known or could have done. Factual findings made by Office personnel are the necessary underpinnings to establish obviousness.

Once the findings of fact are articulated, Office personnel must provide an explanation to support an obviousness rejection under 35 U.S.C. 103. 35 U.S.C. 132 requires that the applicant be notified of the reasons for the rejection of the claim so that he or she can decide how best to proceed. Clearly setting forth findings of fact and the rationale(s) to support a rejection in an Office action leads to the prompt

resolution of issues pertinent to patentability.²²

In short, the focus when making a determination of obviousness should be on what a person of ordinary skill in the pertinent art would have known at the time of the invention, and on what such a person would have reasonably expected to have been able to do in view of that knowledge. This is so regardless of whether the source of that knowledge and ability was documentary prior art, general knowledge in the art, or common sense. What follows is a discussion of the *Graham* factual inquiries.

A. Determining the Scope and Content of the Prior Art

In determining the scope and content of the prior art, Office personnel must first obtain a thorough understanding of the invention disclosed and claimed in the application under examination by reading the specification, including the claims, to understand what the applicant has invented.²³ The scope of the claimed invention must be clearly determined by giving the claims the “broadest reasonable interpretation consistent with the specification.”²⁴ Once the scope of the claimed invention is determined, Office personnel must then determine what to search for and where to search.

1. *What to search for:* The search should cover the claimed subject matter and should also cover the disclosed features which might reasonably be expected to be claimed.²⁵ Although a rejection need not be based on a teaching or suggestion to combine, a preferred search will be directed to finding references that provide such a teaching or suggestion if they exist.

2. *Where to search:* Office personnel should continue to follow the general search guidelines set forth in MPEP § 904 to § 904.03 regarding search of the prior art. Office personnel are reminded that, for purposes of 35 U.S.C. 103, prior art can be either in the field of applicant’s endeavor or be reasonably pertinent to the particular problem with which the applicant was concerned. Furthermore, prior art that is in a field of endeavor other than that of the applicant,²⁶ or solves a problem which

²⁰ The *Graham* factors were reaffirmed and relied upon by the Supreme Court in its consideration and determination of obviousness in the fact situation presented in *KSR*, 550 U.S. at ___, 82 USPQ2d at 1391. The Supreme Court has utilized the *Graham* factors in each of its obviousness decisions since *Graham*. See *Sakruit v. Ag Pro, Inc.*, 425 U.S. 273, 189 USPQ 449, reh’g denied, 428 U.S. 955 (1976); *Dann v. Johnston*, 425 U.S. 219, 189 USPQ 257 (1976); and *Anderson’s-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57, 163 USPQ 673 (1969).

²¹ *KSR*, 550 U.S. at ___, 82 USPQ2d at 1391.

²² These guidelines focus on the proper content of an obviousness rejection, and should not be construed as dictating any particular format.

²³ See MPEP § 904 (8th edition, revision 5, August 2006).

²⁴ See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316, 75 USPQ2d 1321, 1329 (Fed. Cir. 2005) and MPEP § 2111.

²⁵ See MPEP § 904.02.

²⁶ As noted by the Court in *KSR*, “[w]hen a work is available in one field of endeavor, design

Continued

is different from that which the applicant was trying to solve, may also be considered for the purposes of 35 U.S.C. 103.²⁷

For a discussion of what constitutes prior art, see MPEP § 901 to § 901.06(d) and § 2121 to § 2129.

B. Ascertaining the Differences Between the Claimed Invention and the Prior Art

Ascertaining the differences between the claimed invention and the prior art requires interpreting the claim language,²⁸ and considering both the invention and the prior art as a whole.²⁹

C. Resolving the Level of Ordinary Skill in the Art

Any obviousness rejection should include, either explicitly or implicitly in view of the prior art applied, an indication of the level of ordinary skill. A finding as to the level of ordinary skill may be used as a partial basis for a resolution of the issue of obviousness.

The person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention. Factors that may be considered in determining the level of ordinary skill in the art may include: (1) "Type of problems encountered in the art;" (2) "prior art solutions to those problems;" (3) "rapidity with which innovations are made;" (4) "sophistication of the technology;" and (5) "educational level of active workers in the field. In a given case, every factor may not be present,

incentives and other market forces can prompt variations of it, either in the same field or a different one." (Emphasis added) 550 U.S. at __, 82 USPQ2d at 1396.

²⁷ The Court in *KSR* stated that "[t]he first error . . . in this case was . . . holding that courts and patent examiners should look only to the problem the patentee was trying to solve. The Court of Appeals failed to recognize that the problem motivating the patentee may be only one of many addressed by the patent's subject matter The second error [was] . . . that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem." 550 U.S. at __, 82 USPQ2d at 1397. Federal Circuit case law prior to the Supreme Court's decision in *KSR* is generally in accord with these statements by the *KSR* Court. See, e.g., *In re Dillon*, 919 F.2d 688, 693, 16 USPQ2d 1897, 1901 (Fed. Cir. 1990) (en banc) ("[i]t is not necessary in order to establish a *prima facie* case of obviousness that both a structural similarity between a claimed and prior art compound (or a key component of a composition) be shown and that there be a suggestion in or expectation from the prior art that the claimed compound or composition will have the same or a similar utility as one newly discovered by applicant."); *In re Lintner*, 458 F.2d 1013, 1018, 173 USPQ 560, 562 (CCPA 1972) ("The fact that [applicant] uses sugar for a different purpose does not alter the conclusion that its use in a prior art composition would be *prima facie* obvious from the purpose disclosed in the references.").

²⁸ See MPEP § 2111.

²⁹ See MPEP § 2141.02.

and one or more factors may predominate."³⁰

"A person of ordinary skill in the art is also a person of ordinary creativity, not an automaton."³¹ "[I]n many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle."³² Office personnel may also take into account "the inferences and creative steps that a person of ordinary skill in the art would employ."³³

In addition to the factors above, Office personnel may rely on their own technical expertise to describe the knowledge and skills of a person of ordinary skill in the art.³⁴

III. Rationales To Support Rejections Under 35 U.S.C. 103

Once the *Graham* factual inquiries are resolved, Office personnel must determine whether the claimed invention would have been obvious to one of ordinary skill in the art.

The obviousness analysis cannot be confined by . . . overemphasis on the importance of published articles and the explicit content of issued patents In many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature, will drive design trends.³⁵

Prior art is not limited just to the references being applied, but includes the understanding of one of ordinary skill in the art. The prior art reference (or references when combined) need not teach or suggest all the claim limitations; however, Office personnel must explain why the difference(s) between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art. The "mere existence of differences between the prior art and an invention does not establish the invention's nonobviousness."³⁶ The gap between the prior art and the claimed invention may not be "so great as to render the

³⁰ *In re GPAC*, 57 F.3d 1573, 1579, 35 USPQ2d 1116, 1121 (Fed. Cir. 1995); *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962, 1 USPQ2d 1196, 1201 (Fed. Cir. 1986); *Env'l. Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696, 218 USPQ 865, 868 (Fed. Cir. 1983).

³¹ *KSR*, 550 U.S. at __, 82 USPQ2d at 1397.

³² *Id.*

³³ *Id.* at __, 82 USPQ2d at 1396.

³⁴ The Federal Circuit has stated that examiners and administrative patent judges on the Board are "persons of scientific competence in the fields in which they work" and that their findings are "informed by their scientific knowledge, as to the meaning of prior art references to persons of ordinary skill in the art." *In re Berg*, 320 F.3d 1310, 1315, 65 USPQ2d 2003, 2007 (Fed. Cir. 2003).

³⁵ *KSR*, 550 U.S. at __, 82 USPQ2d at 1396.

³⁶ *Dann v. Johnston*, 425 U.S. 219, 230, 189 USPQ 257, 261 (1976).

[claim] nonobvious to one reasonably skilled in the art."³⁷ In determining obviousness, neither the particular motivation to make the claimed invention nor the problem the inventor is solving controls. The proper analysis is whether the claimed invention would have been obvious to one of ordinary skill in the art after consideration of all the facts.³⁸ Factors other than the disclosures of the cited prior art may provide a basis for concluding that it would have been obvious to one of ordinary skill in the art to bridge the gap. The rationales discussed below outline reasoning that may be applied to find obviousness in such cases.

If the search of the prior art and the resolution of the *Graham* factual inquiries reveal that an obviousness rejection may be made using the familiar teaching-suggestion-motivation (TSM) rationale, then such a rejection using the TSM rationale can still be made. Although the Supreme Court in *KSR* cautioned against an overly rigid application of TSM, it also recognized that TSM was one of a number of valid rationales that could be used to determine obviousness.³⁹ Office personnel should also consider whether one or more of the other rationales set forth below support a conclusion of obviousness.⁴⁰ Note that the list of rationales provided below is not intended to be an all-inclusive list. Other rationales to support a conclusion of obviousness may be relied upon by Office personnel.

The key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. The Supreme Court in *KSR* noted that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit. The Court quoting *In re Kahn*⁴¹ stated that "[R]ejections on obviousness cannot be sustained by

³⁷ *Id.*

³⁸ 35 U.S.C. 103(a).

³⁹ According to the Supreme Court, establishment of the TSM approach to the question of obviousness "captured a helpful insight." 550 U.S. at __, 82 USPQ2d 1385, 1396 (citing *In re Bergel*, 292 F.2d 955, 956-57, 130 USPQ 206, 207-08 (1961)). Furthermore, the Court explained that "[t]here is no necessary inconsistency between the idea underlying the TSM test and the *Graham* analysis." *KSR*, 550 U.S. at __, 82 USPQ2d at 1396. The Supreme Court also commented that the Federal Circuit "no doubt has applied the test in accord with these principles [set forth in *KSR*] in many cases." *Id.* at __, 82 USPQ2d at 1396.

⁴⁰ The Court in *KSR* identified a number of rationales to support a conclusion of obviousness which are consistent with the proper "functional approach" to the determination of obviousness as laid down in *Graham*. *Id.* at __, 82 USPQ2d at 1395-97.

⁴¹ 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006).

mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”⁴²

Rationales

(A) Combining prior art elements according to known methods to yield predictable results;

(B) Simple substitution of one known element for another to obtain predictable results;

(C) Use of known technique to improve similar devices (methods, or products) in the same way;

(D) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;

(E) “Obvious to try”—choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;

(F) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design, incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art;

(G) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

The subsections below include discussions of each rationale along with examples illustrating how the cited rationales may be used to support a finding of obviousness. The cases cited (from which the facts were derived) may not necessarily stand for the proposition that the particular rationale is the basis for the court’s holding of obviousness. Note that, in some instances, a single case is used in different subsections to illustrate the use of more than one rationale to support a finding of obviousness. It may often be the case that, once the *Graham* inquiries have been satisfactorily resolved, a conclusion of obviousness may be supported by more than one line of reasoning.

A. Combining Prior Art Elements According to Known Methods To Yield Predictable Results

To reject a claim based on this rationale, Office personnel must resolve the *Graham* factual inquiries. Office personnel must then articulate the following:

(1) a finding that the prior art included each element claimed, although not

⁴² KSR, 550 U.S. at ___, 82 USPQ2d at 1396.

necessarily in a single prior art reference, with the only difference between the claimed invention and the prior art being the lack of actual combination of the elements in a single prior art reference;

(2) a finding that one of ordinary skill in the art could have combined the elements as claimed by known methods, and that in combination, each element merely would have performed the same function as it did separately;

(3) a finding that one of ordinary skill in the art would have recognized that the results of the combination were predictable; and

(4) whatever additional findings based on the *Graham* factual inquiries may be necessary, in view of the facts of the case under consideration, to explain a conclusion of obviousness.

The rationale to support a conclusion that the claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art at the time of the invention.⁴³ “[I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.”⁴⁴ If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art.

Example 1: The claimed invention in *Anderson’s-Black Rock, Inc. v. Pavement Salvage Co.*⁴⁵ was a paving machine which combined several well-known elements onto a single chassis. Standard prior art paving machines typically combined equipment for spreading and shaping asphalt onto a single chassis. The patent claim included the well-known element of a radiant-heat burner attached to the side of the paver for the purpose of preventing cold joints during continuous strip paving.⁴⁶ All of the component parts were known in the prior art. The only difference was the combination of the “old elements” into a single device by mounting them on a single chassis. The Court found that the operation of the heater was in no way dependent on the operation of the other equipment, and that a separate heater could also be used in conjunction with a

⁴³ *Id.* at ___, 82 USPQ2d at 1395; *Sakraida v. AG Pro, Inc.*, 425 U.S. 273, 282, 189 USPQ 449, 453 (1976); *Anderson’s-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57, 62–63, 163 USPQ 673, 675 (1969); *Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp.*, 340 U.S. 147, 152, 87 USPQ 303, 306 (1950).

⁴⁴ KSR, 550 U.S. at ___, 82 USPQ2d at 1398.

⁴⁵ 396 U.S. 57, 163 USPQ 673 (1969).

⁴⁶ The prior art used radiant heat for softening the asphalt to make patches, but did not use radiant heat burners to achieve continuous strip paving.

standard paving machine to achieve the same results. The Court concluded that “[t]he convenience of putting the burner together with the other elements in one machine, though perhaps a matter of great convenience, did not produce a ‘new’ or ‘different function’”⁴⁷ and that to those skilled in the art the use of the old elements in combination would have been obvious.

Note that combining known prior art elements is not sufficient to render the claimed invention obvious if the results would not have been predictable to one of ordinary skill in the art.⁴⁸ “When the prior art teaches away from combining certain known elements, discovery of successful means of combining them is more likely to be nonobvious.”⁴⁹

Example 2: The claimed invention in *Ruiz v. AB Chance Co.*⁵⁰ was directed to a system which employs a screw anchor for underpinning existing foundations and a metal bracket to transfer the building load onto the screw anchor. The prior art (Fuller) used screw anchors for underpinning existing structural foundations. Fuller used a concrete haunch to transfer the load of the foundation to the screw anchor. The prior art (Gregory) used a push pier for underpinning existing structural foundations. Gregory taught a method of transferring load using a bracket, specifically, a metal bracket transfers the foundation load to the push pier. The pier is driven into the ground to support the load. Neither reference showed the two elements of the claimed invention—screw anchor and metal bracket—used together. The court found that “artisans knew that a foundation underpinning system requires a means of connecting the foundation to the load-bearing member.”⁵¹

The nature of the problem to be solved—underpinning unstable foundations—as well as the need to connect the member to the foundation to accomplish this goal, would have led one of ordinary skill in the art to choose an appropriate load bearing member and a compatible attachment. Therefore, it would have been obvious to use a metal bracket (as shown in Gregory) in combination with the screw anchor (as

⁴⁷ *Id.* at 60, 163 USPQ at 674.

⁴⁸ *United States v. Adams*, 383 U.S. 39, 51–52, 148 USPQ 479, 483 (1966). In *Adams*, the claimed invention was to a battery with one magnesium electrode and one cuprous chloride electrode that could be stored dry and activated by the addition of plain water or salt water. Although magnesium and cuprous chloride were individually known battery components, the Court concluded that the claimed battery was nonobvious. The Court stated that “[d]espite the fact that each of the elements of the Adams battery was well known in the prior art, to combine them as did Adams required that a person reasonably skilled in the prior art must ignore” the teaching away of the prior art that such batteries were impractical and that water-activated batteries were successful only when combined with electrolytes detrimental to the use of magnesium electrodes. *Id.* at 42–43, 50–52, 148 USPQ at 480, 483.

⁴⁹ KSR, 550 U.S. at ___, 82 USPQ2d at 1395.

⁵⁰ 357 F.3d 1270, 69 USPQ2d 1686 (Fed. Cir. 2004).

⁵¹ *Id.* at 1278, 69 USPQ2d at 1691.

shown in Fuller) to underpin unstable foundations.

B. Simple Substitution of One Known Element for Another To Obtain Predictable Results

To reject a claim based on this rationale, Office personnel must resolve the *Graham* factual inquiries. Office personnel must then articulate the following:

(1) a finding that the prior art contained a device (method, product, etc.) which differed from the claimed device by the substitution of some components (step, element, etc.) with other components;

(2) a finding that the substituted components and their functions were known in the art;

(3) a finding that one of ordinary skill in the art could have substituted one known element for another, and the results of the substitution would have been predictable; and

(4) whatever additional findings based on the *Graham* factual inquiries may be necessary, in view of the facts of the case under consideration, to explain a conclusion of obviousness.

The rationale to support a conclusion that the claim would have been obvious is that the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention. If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art.

Example 1: The claimed invention in *In re Fout*⁵² was directed to a method for decaffeinating coffee or tea. The prior art (Pagliaro) method produced a decaffeinated vegetable material and trapped the caffeine in a fatty material (such as oil). The caffeine was then removed from the fatty material by an aqueous extraction process. Applicant (Fout) substituted an evaporative distillation step for the aqueous extraction step. The prior art (Waterman) suspended coffee in oil and then directly distilled the caffeine through the oil. The court found that “[b]ecause both Pagliaro and Waterman teach method for separating caffeine from oil, it would have been *prima facie* obvious to substitute one method for the other. Express suggestion to substitute one equivalent for another need not be present to render such substitution obvious.”⁵³

Example 2: The invention in *In re O'Farrell*⁵⁴ was directed to a method for synthesizing a protein in a transformed bacterial host species by substituting a heterologous gene for a gene native to the host species. Generally speaking, protein synthesis *in vivo* follows the path of DNA to RNA to protein. Although the prior art

Polisky article (authored by two of the three inventors of the application) had explicitly suggested employing the method described for protein synthesis, the inserted heterologous gene exemplified in the article was one that normally did not proceed all the way to the protein production step, but instead terminated with the RNA. A second reference to Bahl had described a general method of inserting chemically synthesized DNA into a plasmid. Thus, it would have been obvious to one of ordinary skill in the art to replace the prior art gene with another gene known to lead to protein production, because one of ordinary skill in the art would have been able to carry out such a substitution, and the results were reasonably predictable.

In response to applicant's argument that there had been significant unpredictability in the field of molecular biology at the time of the invention, the court stated that the level of skill was quite high and that the teachings of Polisky, even taken alone, contained detailed enabling methodology and included the suggestion that the modification would be successful for synthesis of proteins.

This is not a situation where the rejection is a statement that it would have been “obvious to try” without more. Here there was a reasonable expectation of success. “Obviousness does not require absolute predictability of success.”⁵⁵

Example 3: The fact pattern in *Ruiz v. AB Chance Co.*⁵⁶ is set forth above in Example 2 in subsection III.A.

The prior art showed differing load-bearing members and differing means of attaching the foundation to the member. Therefore, it would have been obvious to one of ordinary skill in the art to substitute the metal bracket taught in Gregory for Fuller's concrete haunch for the predictable result of transferring the load.

Example 4: The claimed invention in *Ex parte Smith*⁵⁷ was pocket insert for a bound book made by gluing a base sheet and a pocket sheet of paper together to form a continuous two-ply seam defining a closed pocket. The prior art (Wyant) disclosed at least one pocket formed by folding a single sheet and securing the folder portions along the inside margins using any convenient bonding method. The prior art (Wyant) did not disclose bonding the sheets to form a continuous two-ply seam. The prior art (Dick) disclosed a pocket that is made by stitching or otherwise securing two sheets along three of its four edges to define a closed pocket with an opening along its fourth edge.

In considering the teachings of Wyant and Dick, the Board “found that (1) each of the claimed elements is found within

the scope and content of the prior art; (2) one of ordinary skill in the art could have combined the elements as claimed by methods known at the time the invention was made; and (3) one of ordinary skill in the art would have recognized at the time the invention was made that the capabilities or functions of the combination were predictable.” Citing *KSR*, the Board concluded that “[t]he substitution of the continuous, two-ply seam of Dick for the folded seam of Wyant thus is no more than ‘the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for improvement.’”

C. Use of Known Technique To Improve Similar Devices (Methods, or Products) in the Same Way

To reject a claim based on this rationale, Office personnel must resolve the *Graham* factual inquiries. Office personnel must then articulate the following:

(1) a finding that the prior art contained a “base” device (method, or product) upon which the claimed invention can be seen as an “improvement;”

(2) a finding that the prior art contained a “comparable” device (method, or product that is not the same as the base device) that was improved in the same way as the claimed invention;

(3) a finding that one of ordinary skill in the art could have applied the known “improvement” technique in the same way to the “base” device (method, or product) and the results would have been predictable to one of ordinary skill in the art; and

(4) whatever additional findings based on the *Graham* factual inquiries may be necessary, in view of the facts of the case under consideration, to explain a conclusion of obviousness.

The rationale to support a conclusion that the claim would have been obvious is that a method of enhancing a particular class of devices (methods, or products) was made part of the ordinary capabilities of one skilled in the art based upon the teaching of such improvement in other situations. One of ordinary skill in the art would have been capable of applying this known method of enhancement to a “base” device (method, or product) in the prior art and the results would have been predictable to one of ordinary skill in the art. The Supreme Court in *KSR* noted that if the actual application of the technique would have been beyond the skill of one of ordinary skill in the art, then using the technique would not have been obvious.⁵⁸ If any of these findings cannot be made, then this

⁵² 675 F.2d 297, 213 USPQ 532 (CCPA 1982).

⁵³ *Id.* at 301, 213 USPQ at 536.

⁵⁴ 853 F.2d 894, 7 USPQ2d 1673 (Fed. Cir. 1988).

⁵⁵ *Id.* at 903, 7 USPQ2d at 1681.

⁵⁶ 357 F.3d 1270, 69 USPQ2d 1686 (Fed. Cir. 2004).

⁵⁷ 83 USPQ2d 1509 (Bd. Pat. App. & Int. 2007).

⁵⁸ *KSR*, 550 U.S. at 412, 82 USPQ2d at 1396.

rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art.

Example 1: The claimed invention in *In re Nilssen*⁵⁹ was directed to a "means by which the self-oscillating inverter in a power-line-operated inverter-type fluorescent lamp ballast is disabled in case the output current from the inverter exceeds some pre-established threshold level for more than a very brief period."⁶⁰ That is, the current output was monitored, and if the current output exceeded some threshold for a specified short time, an actuation signal was sent and the inverter was disabled to protect it from damage.

The prior art (a USSR certificate) described a device for protecting an inverter circuit in an undisclosed manner via a control means. The device indicated the high-load condition by way of the control means, but did not indicate the specific manner of overload protection. The prior art (Kammiller) disclosed disabling the inverter in the event of a high-load current condition in order to protect the inverter circuit. That is, the overload protection was achieved by disabling the inverter by means of a cutoff switch.

The court found "it would have been obvious to one of ordinary skill in the art to use the threshold signal produced in the USSR device to actuate a cutoff switch to render the inverter inoperative as taught by Kammiller."⁶¹ That is, using the known technique of a cutoff switch for protecting a circuit to provide the protection desired in the inverter circuit of the USSR document would have been obvious to one of ordinary skill.

Example 2: The fact pattern in *Ruiz v. AB Chance Co.*⁶² is set forth above in Example 2 in subsection III.A.

The nature of the problem to be solved may lead inventors to look at references relating to possible solutions to that problem.⁶³ Therefore, it would have been obvious to use a metal bracket (as shown in Gregory) with the screw anchor (as shown in Fuller) to underpin unstable foundations.

D. Applying a Known Technique to a Known Device (Method, or Product) Ready for Improvement To Yield Predictable Results

To reject a claim based on this rationale, Office personnel must resolve the *Graham* factual inquiries. Office

personnel must then articulate the following:

(1) a finding that the prior art contained a "base" device (method, or product) upon which the claimed invention can be seen as an "improvement;"

(2) a finding that the prior art contained a known technique that is applicable to the base device (method, or product);

(3) a finding that one of ordinary skill in the art would have recognized that applying the known technique would have yielded predictable results and resulted in an improved system; and

(4) whatever additional findings based on the *Graham* factual inquiries may be necessary, in view of the facts of the case under consideration, to explain a conclusion of obviousness.

The rationale to support a conclusion that the claim would have been obvious is that a particular known technique was recognized as part of the ordinary capabilities of one skilled in the art. One of ordinary skill in the art would have been capable of applying this known technique to a known device (method, or product) that was ready for improvement and the results would have been predictable to one of ordinary skill in the art. If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art.

Example 1: The claimed invention in *Dann v. Johnston*⁶⁴ was directed towards a system (i.e., computer) for automatic record keeping of bank checks and deposits. In this system, a customer would put a numerical category code on each check or deposit slip. The check processing system would record these on the check in magnetic ink, just as it did for amount and account information. With this system in place, the bank can provide statements to customers that are broken down to give subtotals for each category. The claimed system also allowed the bank to print reports according to a style requested by the customer. As characterized by the Court, "[u]nder respondent's invention, then, a general purpose computer is programmed to provide bank customers with an individualized and categorized breakdown of their transactions during the period in question."⁶⁵

Base System—The nature of the current use of data processing equipment and computer software in the banking industry was that banks routinely did much of the record keeping automatically. In routine check processing, the system read any magnetic ink characters identifying the account and routing. The system also read the amount of the check and then printed that value in a designated area of the check. The check was then sent

through a further data processing step which used the magnetic ink information to generate the appropriate records for transactions and for posting to the appropriate accounts. These systems included generating periodic statements for each account, such as the monthly statement sent to checking account customers.

Improved System—The claimed invention supplemented this system by recording a category code which can then be utilized to track expenditures by category. Again, the category code will be a number recorded on the check (or deposit slip) which will be read, converted into a magnetic ink imprint, and then processed in the data system to include the category code. This enabled reporting of data by category as opposed to only allowing reporting by account number.

Known Technique—This is an application of technique from the prior art—the use of account numbers (generally used to track an individual's total transactions) to solve the problem of how to track categories of expenditures to more finely account for a budget. That is, account numbers (identifying data capable of processing in the automatic data processing system) were used to distinguish between different customers. Furthermore, banks have long segregated debits attributable to service charges within any given separate account and have rendered their customers subtotals for those charges. Previously, one would have needed to set up separate accounts for each category and thus receive separate reports. Supplementing the account information with additional digits (the category codes) solved the problem by effectively creating a single account that can be treated as distinct accounts for tracking and reporting services. That is, the category code merely allowed what might previously have been separate accounts to be handled as a single account, but with a number of sub-accounts indicated in the report.

The basic technique of putting indicia on data which then enabled standard sorting, searching, and reporting would have yielded no more than the predictable outcome which one of ordinary skill would have expected to achieve with this common tool of the trade and was therefore an obvious expedient. The Court held that "[t]he gap between the prior art and respondent's system is simply not so great as to render the system nonobvious to one reasonably skilled in the art."⁶⁶

⁵⁹ 851 F.2d 1401, 7 USPQ2d 1500 (Fed. Cir. 1988).

⁶⁰ *Id.* at 1402, 7 USPQ2d at 1501.

⁶¹ *Id.* at 1403, 7 USPQ2d at 1502.

⁶² 357 F.3d 1270, 69 USPQ2d 1686 (Fed. Cir. 2004).

⁶³ *Id.* at 1277, 69 USPQ2d at 1691.

⁶⁴ 425 U.S. 219, 189 USPQ 257 (1976).

⁶⁵ *Id.* at 222, 189 USPQ at 259.

⁶⁶ *Id.* at 230, 189 USPQ at 261.

Example 2: The fact pattern in *In re Nilssen*⁶⁷ is set forth above in Example 1 in subsection III.C.

The court found "it would have been obvious to one of ordinary skill in the art to use the threshold signal produced in the USSR device to actuate a cutoff switch to render the inverter inoperative as taught by Kammiller."⁶⁸ The known technique of using a cutoff switch would have predictably resulted in protecting the inverter circuit. Therefore, it would have been within the skill of the ordinary artisan to use a cutoff switch in response to the actuation signal to protect the inverter.

E. "Obvious To Try"—Choosing From a Finite Number of Identified, Predictable Solutions, With a Reasonable Expectation of Success

To reject a claim based on this rationale, Office personnel must resolve the *Graham* factual inquiries. Office personnel must then articulate the following:

(1) a finding that at the time of the invention, there had been a recognized problem or need in the art, which may include a design need or market pressure to solve a problem;

(2) a finding that there had been a finite number of identified, predictable potential solutions to the recognized need or problem;

(3) a finding that one of ordinary skill in the art could have pursued the known potential solutions with a reasonable expectation of success; and

(4) whatever additional findings based on the *Graham* factual inquiries may be necessary, in view of the facts of the case under consideration, to explain a conclusion of obviousness.

The rationale to support a conclusion that the claim would have been obvious is that "a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under § 103."⁶⁹ If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art.

Example 1: The claimed invention in *Pfizer, Inc. v. Apotex, Inc.*⁷⁰ was directed to the amlodipine besylate drug product, which is commercially sold in tablet form in the United States under the trademark Norvasc®.

At the time of the invention, amlodipine was known as was the use of besylate anions. Amlodipine was known to have the same therapeutic properties as were being claimed for the amlodipine besylate but Pfizer discovered that the besylate form had better manufacturing properties (e.g., reduced "stickiness").

Pfizer argued that the results of forming amlodipine besylate would have been unpredictable, and therefore were nonobvious. The court rejected the notion that unpredictability could be equated with nonobviousness here, because there were only a finite number (53) of pharmaceutically acceptable salts to be tested for improved properties.

The court found that one of ordinary skill in the art having problems with the machinability of amlodipine would have looked to forming a salt of the compound and would have been able to narrow the group of potential salt-formers to a group of 53 anions known to form pharmaceutically acceptable salts, which would be an acceptable number to form "a reasonable expectation of success."

Example 2: The claimed invention in *Alza Corp. v. Mylan Laboratories, Inc.*⁷¹ was drawn to sustained-release formulations of the drug oxybutynin in which the drug is released at a specified rate over a 24-hour period. Oxybutynin was known to be highly water-soluble, and the specification had pointed out that development of sustained-release formulations of such drugs presented particular problems.

A prior art patent to Morella had taught sustained-release compositions of highly water-soluble drugs, as exemplified by a sustained-release formulation of morphine. Morella had also identified oxybutynin as belonging to the class of highly water-soluble drugs. The Baichwal prior art patent had taught a sustained-release formulation of oxybutynin that had a different release rate than the claimed invention. Finally, the Wong prior art patent had taught a generally applicable method for delivery of drugs over a 24-hour period. Although Wong mentioned applicability of the disclosed method to several categories of drugs to which oxybutynin belonged, Wong did not specifically mention its applicability to oxybutynin.

The court found that because the absorption properties of oxybutynin would have been reasonably predictable at the time of the invention, there would have been a reasonable expectation of successful development of a sustained-release formulation of oxybutynin as claimed. The prior art, as evidenced by the specification, had recognized the obstacles to be overcome in

development of sustained-release formulations of highly water-soluble drugs, and had suggested a finite number of ways to overcome these obstacles. The claims were obvious because it would have been obvious to try the known methods for formulating sustained-release compositions, with a reasonable expectation of success. The court was not swayed by arguments of a lack of absolute predictability.

Example 3: The claimed invention in *Ex parte Kubin*⁷² was an isolated nucleic acid molecule. The claim stated that the nucleic acid encoded a particular polypeptide. The encoded polypeptide was identified in the claim by its partially specified sequence, and by its ability to bind to a specified protein.

A prior art patent to Valiante taught the polypeptide encoded by the claimed nucleic acid, but did not disclose either the sequence of the polypeptide, or the claimed isolated nucleic acid molecule. However, Valiante did disclose that by employing conventional methods, such as those disclosed by a prior art laboratory manual by Sambrook, the sequence of the polypeptide could be determined, and the nucleic acid molecule could be isolated. In view of Valiante's disclosure of the polypeptide, and of routine prior art methods for sequencing the polypeptide and isolating the nucleic acid molecule, the Board found that a person of ordinary skill in the art would have had a reasonable expectation that a nucleic acid molecule within the claimed scope could have been successfully obtained.

Relying on *In re Deuel*, Appellant argued that it was improper for the Office to use the polypeptide of the Valiante patent together with the methods described in Sambrook to reject a claim drawn to a specific nucleic acid molecule without providing a reference showing or suggesting a structurally similar nucleic acid molecule. Citing *KSR*, the Board stated that "when there is motivation to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to anticipated success, it is likely the product not of innovation but of ordinary skill and common sense." The Board noted that the problem facing those in the art was to isolate a specific nucleic acid, and there were a limited number of methods available to do so. The Board concluded that the skilled artisan would have had reason to try these methods with the reasonable expectation that at least one would be successful. Thus, isolating the

⁶⁷ 851 F.2d 1401, 7 USPQ2d 1500 (Fed. Cir. 1988).

⁶⁸ *Id.* at 1403, 7 USPQ2d at 1502.

⁶⁹ *KSR*, 550 U.S. at ___, 82 USPQ2d at 1397.

⁷⁰ 480 F.3d 1348, 82 USPQ2d 1321 (Fed. Cir. 2007).

⁷¹ 464 F.3d 1286, 80 USPQ2d 1001 (Fed. Cir. 2006).

⁷² 83 USPQ2d 1410 (Bd. Pat. App. & Int. 2007).

specific nucleic acid molecule claimed was "the product not of innovation but of ordinary skill and common sense."

F. Known Work in One Field of Endeavor May Prompt Variations of it for Use in Either the Same Field or a Different One Based on Design Incentives or Other Market Forces if The Variations Would Have Been Predictable to One of Ordinary Skill in the Art

To reject a claim based on this rationale, Office personnel must resolve the *Graham* factual inquiries. Office personnel must then articulate the following:

(1) a finding that the scope and content of the prior art, whether in the same field of endeavor as that of the applicant's invention or a different field of endeavor, included a similar or analogous device (method, or product);

(2) a finding that there were design incentives or market forces which would have prompted adaptation of the known device (method, or product);

(3) a finding that the differences between the claimed invention and the prior art were encompassed in known variations or in a principle known in the prior art;

(4) a finding that one of ordinary skill in the art, in view of the identified design incentives or other market forces, could have implemented the claimed variation of the prior art, and the claimed variation would have been predictable to one of ordinary skill in the art; and

(5) whatever additional findings based on the *Graham* factual inquiries may be necessary, in view of the facts of the case under consideration, to explain a conclusion of obviousness.

The rationale to support a conclusion that the claimed invention would have been obvious is that design incentives or other market forces could have prompted one of ordinary skill in the art to vary the prior art in a predictable manner to result in the claimed invention. If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art.

Example 1: The fact pattern in *Dann v. Johnston*⁷³ is set forth above in Example 1 in subsection III.D.

The court found that the problem addressed by applicant—the need to give more detailed breakdown by a category of transactions—was closely analogous to the task of keeping track of the transaction files of individual business units.⁷⁴ Thus, an artisan in the data processing area would have recognized the similar class of problem

and the known solutions of the prior art and it would have been well within the ordinary skill level to implement the system in the different environment. The court held that "[t]he gap between the prior art and respondent's system is simply not so great as to render the system nonobvious to one reasonably skilled in the art."⁷⁵

Example 2: The claimed invention in *Leapfrog Enterprises, Inc. v. Fisher-Price, Inc.*⁷⁶ was directed to a learning device to help young children read phonetically.

The claim read as follows:

An interactive learning device, comprising:

a housing including a plurality of switches; a sound production device in communication with the switches and including a processor and a memory; at least one depiction of a sequence of letters, each letter being associative with a switch; and a reader configured to communicate the identity of the depiction to the processor, wherein selection of a depicted letter activates an associated switch to communicate with the processor, causing the sound production device to generate a signal corresponding to a sound associated with the selected letter, the sound being determined by a position of the letter in the sequence of letter.

The court concluded that the claimed invention would have been obvious in view of the combination of two pieces of prior art, (1) Bevan (which showed an electro-mechanical toy for phonetic learning), (2) the Super Speak & Read device (SSR) (an electronic reading toy), and the knowledge of one of ordinary skill in the art.

The court made clear that there was no technological advance beyond the skill shown in the SSR device. The court stated that "one of ordinary skill in the art of children's learning toys would have found it obvious to combine the Bevan device with the SSR to update it using modern electronic components in order to gain the commonly understood benefits of such adaptation, such as decreased size, increased reliability, simplified operation, and reduced cost. While the SSR only permits generation of a sound corresponding to the first letter of a word, it does so using electronic means. The combination is thus the adaptation of an old idea or invention (Bevan) using newer technology that is commonly available and understood in the art (the SSR)."

The court found that the claimed invention was but a variation on already known children's toys. This variation

presented no nonobvious advance over other toys. The court made clear that there was no technological advance beyond the skill shown in the SSR device. The court found that "[a]ccommodating a prior art mechanical device that accomplishes that goal to modern electronics would have been reasonably obvious to one of ordinary skill in designing children's learning devices. Applying modern electronics to older mechanical devices has been commonplace in recent years."

Example 3: The claimed invention in *KSR International Co. v. Teleflex Inc.*⁷⁷ was an adjustable pedal assembly with a fixed pivot point and an electronic pedal-position sensor attached to the assembly support. The fixed pivot point meant that the pivot was not changed as the pedal was adjusted. The placement of the sensor on the assembly support kept the sensor fixed while the pedal was adjusted.

Conventional gas pedals operated by a mechanical link which adjusted the throttle based on the travel of the pedal from a set position. The throttle controlled the combustion process and the available power generated by the engine. Newer cars used computer controlled throttles in which a sensor detected the motion of the pedal and sent signals to the engine to adjust the throttle accordingly. At the time of the invention, the marketplace provided a strong incentive to convert mechanical pedals to electronic pedals, and the prior art taught a number of methods for doing so. The prior art (Asano) taught an adjustable pedal with a fixed pivot point with mechanical throttle control. The prior art (1936 patent to Byler) taught an electronic pedal sensor which was placed on a pivot point in the pedal assembly and that it was preferable to detect the pedal's position in the pedal mechanism rather than in the engine. The prior art (Smith) taught that to prevent the wires connecting the sensor to the computer from chafing and wearing out, the sensor should be put on a fixed part of the pedal assembly rather than in or on the pedal's footpad. The prior art (Rixon) taught an adjustable pedal assembly (sensor in the footpad) with an electronic sensor for throttle control. There was no prior art electronic throttle control that was combined with a pedal assembly which kept the pivot point fixed when adjusting the pedal.

The Court stated that "[t]he proper question to have asked was whether a pedal designer of ordinary skill, facing the wide range of needs created by developments in the field of endeavor, would have seen a benefit to upgrading

⁷³ 425 U.S. 219, 189 USPQ 257 (1976).

⁷⁴ *Id.* at 229, 189 USPQ at 261.

⁷⁵ *Id.* at 230, 189 USPQ at 261.

⁷⁶ 485 F.3d 1157, 82 USPQ2d 1687 (Fed. Cir. 2007).

⁷⁷ 550 U.S. ___, 82 USPQ2d 1385 (2007).

Asano with a sensor.⁷⁸ The Court found that technological developments in the automotive design would have prompted a designer to upgrade Asano with an electronic sensor. The next question was where to attach the sensor. Based on the prior art, a designer would have known to place the sensor on a nonmoving part of the pedal structure and the most obvious nonmoving point on the structure from which a sensor can easily detect the pedal's position was a pivot point. The Court concluded that it would have been obvious to upgrade Asano's fixed pivot point adjustable pedal by replacing the mechanical assembly for throttle control with an electronic throttle control and to mount the electronic sensor on the pedal support structure.

Example 4: The claimed invention in *Ex parte Catan*⁷⁹ was a consumer electronics device using bioauthentication to authorize sub-users of an authorized credit account to place orders over a communication network up to a pre-set maximum sub-credit limit.

The prior art (Nakano) disclosed a consumer electronics device like the claimed invention, except that security was provided by a password authentication device rather than a bioauthentication device. The prior art (Harada) disclosed that the use of a bioauthentication device (fingerprint sensor) on a consumer electronics device (remote control) to provide bioauthentication information (fingerprint) was known in the prior art at the time of the invention. The prior art (Dethloff) also disclosed that it was known in the art at the time of the invention to substitute bioauthentication for PIN authentication to enable a user to access credit via a consumer electronics device.

The Board found that the prior art "shows that one of ordinary skill in the consumer electronic device art at the time of the invention would have been familiar with using bioauthentication information interchangeably with or in lieu of PINs to authenticate users." The Board concluded that one of ordinary skill in the art of consumer electronic devices would have found it obvious to update the prior art password device with the modern bioauthentication component and thereby gain, predictably, the commonly understood benefits of such adaptation, that is, a secure and reliable authentication procedure.

G. Some Teaching, Suggestion, or Motivation in the Prior Art That Would Have Led One of Ordinary Skill To Modify the Prior Art Reference or To Combine Prior Art Reference Teachings To Arrive at the Claimed Invention

To reject a claim based on this rationale, Office personnel must resolve the *Graham* factual inquiries. Office personnel must then articulate the following:

⁷⁸ *Id.* at ..., 82 USPQ2d at 1399.

⁷⁹ 83 USPQ2d 1569 (Bd. Pat. App. & Int.

(1) a finding that there was some teaching, suggestion, or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings;

(2) a finding that there was reasonable expectation of success; and

(3) whatever additional findings based on the *Graham* factual inquiries may be necessary, in view of the facts of the case under consideration, to explain a conclusion of obviousness.

The rationale to support a conclusion that the claim would have been obvious is that "a person of ordinary skill in the art would have been motivated to combine the prior art to achieve the claimed invention and that there would have been a reasonable expectation of success."⁸⁰ If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art.

The courts have made clear that the teaching, suggestion, or motivation test is flexible and an explicit suggestion to combine the prior art is not necessary. The motivation to combine may be implicit and may be found in the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved.⁸¹ "[A]n implicit motivation to combine exists not only when a suggestion may be gleaned from the prior art as a whole, but when the 'improvement' is technology-independent and the combination of references results in a product or process that is more desirable, for example because it is stronger, cheaper, cleaner, faster, lighter, smaller, more durable, or more efficient. Because the desire to enhance commercial opportunities by improving a product or process is universal—and even common-sensical—we have held that there exists in these situations a motivation to combine prior art references even absent any hint of suggestion in the references themselves. In such situations, the proper question is whether the ordinary artisan possesses knowledge and skills rendering him capable of combining the prior art references."⁸²

IV. Applicant's Reply

Once Office personnel have established the *Graham* factual findings and concluded that the claimed invention would have been obvious, the burden then shifts to the applicant to (1)

⁸⁰ *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1360, 80 USPQ2d 1641, 1645 (Fed. Cir. 2006).

⁸¹ *Id.* at 1366, 80 USPQ2d at 1649.

⁸² *Id.* at 1368, 80 USPQ2d at 1651.

show that the Office erred in these findings, or (2) provide other evidence to show that the claimed subject matter would have been nonobvious. 37 CFR 1.111(b) requires applicant to distinctly and specifically point out the supposed errors in the Office's action and reply to every ground of objection and rejection in the Office action. The reply must present arguments pointing out the specific distinction believed to render the claims patentable over any applied references.

If an applicant disagrees with any factual findings by the Office, an effective traverse of a rejection based wholly or partially on such findings must include a reasoned statement explaining why the applicant believes the Office has erred substantively as to the factual findings. A mere statement or argument that the Office has not established a *prima facie* case of obviousness or that the Office's reliance on common knowledge is unsupported by documentary evidence will not be considered substantively adequate to rebut the rejection or an effective traverse of the rejection under 37 CFR 1.111(b). Office personnel addressing this situation may repeat the rejection made in the prior Office action and make the next Office action final. See MPEP § 706.07(a).

V. Consideration of Applicant's Rebuttal Evidence

Office personnel should consider all rebuttal evidence that is timely presented by the applicants when reevaluating any obviousness determination. Rebuttal evidence may include evidence of "secondary considerations," such as "commercial success, long felt but unsolved needs, [and] failure of others"⁸³, and may also include evidence of unexpected results. As set forth in section III. above, Office personnel must articulate findings of fact that support the rationale relied upon in an obviousness rejection. As a result, applicants are likely to submit evidence to rebut the fact finding made by Office personnel. For example, in the case of a claim to a combination, applicants may submit evidence or argument to demonstrate that:

(1) one of ordinary skill in the art could not have combined the claimed elements by known methods (e.g., due to technological difficulties);

(2) the elements in combination do not merely perform the function that each element performs separately; or

(3) the results of the claimed combination were unexpected.

⁸³ *Graham v. John Deere Co.*, 383 U.S. at 17, 148 USPQ at 467.

Once the applicant has presented rebuttal evidence, Office personnel should reconsider any initial obviousness determination in view of the entire record.⁸⁴ All the rejections of record and proposed rejections and their bases should be reviewed to confirm their continued viability. The Office action should clearly communicate the Office's findings and conclusions, articulating how the conclusions are supported by the findings. The procedures set forth in MPEP § 706.07(a) are to be followed in determining whether an action may be made final.

See MPEP § 2145 concerning consideration of applicant's rebuttal evidence. See also MPEP § 716 to

⁸⁴ See, e.g., *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); *In re Eli Lilly & Co.*, 90 F.2d 943, 945, 14 USPQ2d 1741, 1743 (Fed. Cir. 1990).

§ 716.10 regarding affidavits or declarations filed under 37 CFR 1.132 for purposes of traversing grounds of rejection.

Dated: October 3, 2007.

Jon W. Dudas,

Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office.

[IFR Doc. E7-19973 Filed 10-9-07; 8:45 am]

BILLING CODE 3510-16-P

ACTION: Notice.

SUMMARY: The Department of Defense is publishing the unclassified text of a section 36(b)(1) arms sales notification. This is published to fulfill the requirements of section 155 of Public Law 104-164 dated 21 July 1996.

FOR FURTHER INFORMATION CONTACT: Ms. B. English, DSCA/DBO/CFM, (703) 601-3740.

The following is a copy of a letter to the Speaker of the House of Representatives, Transmittals 08-09 with attached transmittal, policy justification, and Sensitivity of Technology.

Dated: October 3, 2007.

L.M. Bynum,

*OSD Federal Register Liaison Officer,
Department of Defense.*

BILLING CODE 5001-06-M

DEPARTMENT OF DEFENSE

Office of the Secretary

[Transmittal Nos. 08-09]

36(b)(1) Arms Sales Notification

AGENCY: Department of Defense, Defense Security Cooperation Agency.